REMARKS/ARGUMENTS

Claims 2, 27, and 28 have been amended. Claims 33-36 have been added. Claims 2, 5-7, 9-15, 27-28, and 30-36 are pending.

The Examiner rejected claims 27-28 under 35 U.S.C. 112. Claims 27 and 28 have been amended accordingly.

The Examiner rejected claims 2, 5-7, 12, and 27-32 under 35 U.S.C. 103 (a) as being unpatentable over Dandl (U.S. Patent 5,370,765) in view of Moslehi et al. (U.S. Patent 5,464,499) or Sekine et al. (U.S. Patent 5,44,207), or Hershkowitz et al. (U.S. Patent 5,302,205). Claim 2 has been amended to recite that the magnetic elements are spaced apart from the wall, so that gas provided by the gas source is able to surround the magnetic elements and go into spaces between the wall and the magnetic elements. This is shown in FIG.'s 2 and 3, where a space is shown between the magnetic elements 702 and the chamber wall 303 and is discussed on page 16, lines 13-19 of the application, where it is discussed how neutrals are not confined by the magnetic field, but instead by the chamber wall and the advantage of allowing a tuning by having the neutrals confined by a larger chamber defined by the chamber wall and the plasma confined by magnets defining a smaller volume within the chamber. It would not be obvious to combine the magnet system in FIG. 5 of Hershkowitz with the other references to obtain the magnetic system as taught in claim 2. A declaration is enclosed explaining why such a combination is not obvious. For at least these reasons, claim 2 is not made obvious by Dandl in view of Moslehi, Sekine, or Hershkowitz.

The Examiner rejected claims 9 and 13-14 under 35 U.S.C. 103 (a) as being unpatentable over Dandl in view of Moslehi, Sekine, or Hershkowitz and further in view of Taira et al. (U.S. Patent 6,153,977).

The Examiner rejected claims 10-11 and 15 under 35 U.S.C. 103 (a) as being unpatentable over Dandl in view of Moslehi, Sekine, or Hershkowitz and further in view of Grunenfelder (U.S. Patent 5,399,253) or Barankova et al. (WO 99/27758).

The Examiner rejected claims 2, 4-7, 12, 15, and 26-32 under 35 U.S.C. 103 (a) as being unpatentable over Dandl (U.S. Patent 5,370,765) in view of Tokyo Electron LTD, JP 7-130495. Claim 2 has been amended to recite that the magnetic elements are spaced apart from the wall, so that gas provided by the gas source is able to surround the magnetic elements and go into spaces between the wall and the magnetic elements. This is shown in FIG.'s 2 and 3, where a space is shown between the magnetic elements 702 and the chamber wall 303 and is discussed on page 16, lines 13-19 of the application, where it is discussed how neutrals are not confined by the magnetic field, but instead by the chamber wall and the advantage of allowing a tuning by having the neutrals confined by a larger chamber defined by the chamber wall and the plasma confined by magnets defining a smaller volume within the chamber. None of the references shows magnets within the chamber wall and spaced apart from the chamber wall so that neutral gas within the chamber can go between the magnets and the chamber wall. For at least these reasons, claim 2 is not made obvious by Dandl in view of Tokyo Electron LTD.

The Examiner rejected claims 9 and 13-14 under 35 U.S.C. 103 (a) as being unpatentable over Dandl in view of Tokyo Electron LTD and further in view of Taira et al. (U.S. Patent 6,153,977).

The Examiner rejected claims 2, 4-7, 12, and 26-32 under 35 U.S.C. 103 (a) as being unpatentable over Hershkowitz et al. (U.S. Patent 5,302,205). It would not be obvious to combine the apparatus of FIG. 5 of Hershkowitz with the magnets of FIG. 3 of Hershkowitz to obtain the invention as recited in claim 2. The Examiner stated that it would have been obvious to modify the apparatus of FIG. 5 of Hershkowitz so as to dispose the plurality of magnetic elements extending substantially from a first end of the process chamber to a chuck because this is an alternative way to generate the magnetic field and enhance the plasma in the processing chamber. Nothing in Hershkowitz suggests that the magnets of FIG. 3 may be used in the device of FIG. 5. The enclosed declaration supports why the invention would not be made obvious by Hershkowitz. In addition, Hershkowitz lacks a clear description as to what exactly is the configuration shown in FIG. 3. For at least these reasons, claim 2, as amended, is not made obvious by Hershkowitz.

The Examiner rejected claims 9 and 13-14 under 35 U.S.C. 103 (a) as being unpatentable over Hershkowitz as applied to claims 2, 4-7, 12, 26-31 above and further in view of Taira et al. (U.S. Patent 6,153,977).

The Examiner rejected claims 10-11 and 15 under 35 U.S.C. 103 (a) as being unpatentable over Hershkowitz and further in view of Grunenfelder (U.S. Patent 5,399,253) or Barankova et al. (WO 99/27758).

Claims 5-7, 9-15, 27-28, and 30-32 each depend either directly or indirectly from independent claim 2, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to independent claim 2. Additionally, these dependent claims require additional elements that when taken in the context of the claimed invention, further patentably distinguish the art of record.

For example, claims 9 14 further recites that the magnetic elements are individually contained within sleeves. None of the cited references recite that the magnetic elements are individually contained within sleeves. Taira, in col. 4, lines 15 to 62, teaches that if a plurality of magnetic elements 5 and 5' are used, then all magnetic elements are placed in the same sleeve, not individually contained within sleeves. It is only when one permanent magnet is used, as shown in fig. 4, that the single permanent magnet is individually contained in a sleeve. The teaching of when only one magnet is used it is placed in an individual sleeve, does not make obvious a plurality of magnetic elements where each magnetic element is in an individual sleeve. In addition, none of the references recites sleeves (plural). None of the references teaches more than one sleeve. Therefore, it would not be obvious under the cited references to use both a plurality of magnetic elements and have each magnetic element individually contained within sleeves. An advantage of containing a plurality of magnetic elements in individual sleeves over containing a plurality of magnets in one sleeve is the reduction of sleeve profile exposed to the plasma. In addition, the attached declaration supports that it would not be obvious to combine the references to obtain the invention, as recited in claims 9 and 14.

In addition, claims 11 and 15 recite that the magnets are rotated or moved. Nothing in the cited references teaches or suggests moving magnets within the chamber wall and spaced

apart from the wall so that gas is able to surround the magnetic elements. The magnets 14 within the chamber in Hershkowitz are not moved or rotated.

Claim 32 further recites a dielectric window at the top of the substantially cylindrical shape. Dandl does not disclose such a dielectric window at the top of the chamber. Hershkowitz does not have such a window, since Hershkowitz teaches that magnets must surround the chamber on all sides, preventing the providing power from a coil through a dielectric window. Instead, Hershkowitz provides power by confining secondary electrons, as discussed in the attached declaration. For at least these reasons, claims 5-7, 9-15, 27-28, and 30-32 are not anticipated or made obvious by the cited references.

New claim 33 further recites that the magnetic field has an azimuthally symmetric radial gradient. New claim 34 further recites that the ends of the magnetic elements are open. New claims 35 and 36 further recites that a coil is adjacent to first ends of the magnets. Hershkowitz would not use a coil at one end, but instead use the confinement of secondary electrons.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (650) 961-8300.

Respectfully submitted,
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